The Effects of Self-Talk on Gross Motor and Precision Tasks in Softball

by

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A Thesis Submitted to the

School of Graduate Studies

In partial fulfilment of the

Requirements for the Degree of

Master of Science

in

Kinesiology

Memorial University of Newfoundland

May 2017

ABSTRACT

The purpose of this study was to further explore which form of self-talk (i.e., instructional or motivational) would enhance performance on precision and gross motor related tasks in the sport of softball. Additionally, the impact of negative self-talk on performance was explored. Eighty participants, forty males and forty female softball players (M = 34.04. SD = 10.16) were randomized into four self-talk groups: (1) instructional, (2) motivational, (3) negative, and (4) control group. Participants in the self-talk groups attended a self-talk training session, and generated their own self-talk statements. One week following the session, all participants completed the athletic tasks (i.e., throwing a ball for distance and throwing at a target) using their generated self-talk statements, and these tasks were repeated two additional times with at least one week between each session. Although the findings were not significant, positive and negative self-talk was found to impact performance. Akin to previous studies, positive self-talk led to enhanced performance in both gross motor and precision tasks, while negative self-talk led to poorer performance in gross motor tasks. It may be suggested that the use of motivational and instructional self-talk may be an important mental training technique that coaches and athletes could utilise when attempting to enhance athletic performance.

Keywords: Self-talk, performance, precision task, gross motor task, softball

ACKNOWLEDGEMENTS

It has been a pleasure working with the faculty at the School of Human Kinetics and Recreation at Memorial University. I would like to thank my primary supervisor, Dr. Basil Kavanagh for accepting me into the program and allowing me to conduct research in an area that I was interested in and being patient while I conducted my research and pursued my career in education at the same time. I would also like to thank my secondary supervisor Dr. Erin McGowan for her help in preparing my research proposal and in the preparation of my thesis topic presentation for the HKR faculty.

I would like to thank Dr. Angela Loucks-Atkinson for allowing me to be a guest speaker for one of her classes. It was also a goal of mine to teach at a post secondary level and being asked to do so was a big thrill and honour for me.

I would also like to thank my former partner, Melanie Penney for encouraging me to pursue a graduate studies program and supporting me through the whole process. I would also like to thank her for her patience while I collected my data and began the writing process.

TABLE OF CONTENTS

LIST OF TABLES

APPENDICES

Chapter 1: Introduction

1.1 Overview

Self-talk has been defined by Hardy (2006) as: (1) statements made both internally or externally to oneself, (2) multidimensional in nature, (3) having interpretive elements associated with the content of statements employed, (4) somewhat dynamic, and (5) serving at least two functions for athletes; instructional and motivational. More simply, self-talk is what people say to themselves either internally or externally while performing a task (Hardy, 2006). Self-talk is widely used as a mental training technique and has been studied and applied to several academic disciplines. These disciplines include educational, exercise and sport psychology. In educational psychology, self-talk has been used to help students improve writing skills, increase effort and improve academic performance (Callicott & Park, 2003; Solley & Payne, 1992), and improve performance in physical education (Zourbanos, 2013). In the area of exercise psychology, self-talk has been used to motivate adults to be more physically active (Hardy, Gammage, & Hall, 2001). However, the majority of self-talk research comes from the field of sport psychology.

When used in the field of sport psychology, self-talk is often divided into two major dimensions, positive self-talk and negative self-talk. Positive self-talk can be defined as "self-talk used by an individual/player to help him or her to stay appropriately focused on the present and prevent him or her from dwelling on past mistakes or projecting too far into the future" (Theodorakis et al., 2000, p. 254). Conversely, negative self-talk has been defined as "self-talk that is detrimental to performance because it is

inappropriate, irrational, counterproductive or anxiety producing" (Theodorakis et al., 2000, p. 254). The use of positive self-talk has been shown to enhance performance in various studies utilizing differing contexts, such as darts (Cumming, Nordin, Horton, & Reynolds, 2006; Van Raalte et al., 1995), diving (Highlen & Bennett, 1983), cycling (Hamilton, Scott, & MacDougal, 2007), figure skating (Ming & Martin, 1996; Palmer, 1992), golf (Harvey, Van Raalte, & Brewer, 2002; Thomas & Fogarty, 1997), soccer (Theodorakis, Weinberg, Natsis, Douma, & Kazakas, 2000), tennis (Cutton & Landin, 2007; Van Raalte, Brewer, Rivera, & Petitpas, 1994; Van Raalte, Cornelius, Brewer, & Hatten, 2000), water polo (Hatzigeorgiadis, Theodorakis, & Zourbanos, 2004), ice hockey (Rogerson & Hrycaiko, 2002), field hockey, (Wrisberg & Anshel, 1997), and basketball (Perkos, Theodorakis, & Chroni, 2002; Theodorakis, Chroni, Laparidis, Bebetsos, & Douma, 2001).

Postive self-talk can be further divided into two categories, motivational and instructional self-talk. Motivational self-talk is believed to facilitate performance by increasing confidence, inspiring greater effort and energy expenditure, and by creating a positive mood (Hardy, Hall, Gibbs, & Greenslade, 2005). Instructional self-talk is thought to enhance performance by triggering desired actions through proper focus, correct technique and strategy execution (Hardy et al., 2005). It has also been suggested that each category of self-talk affects performance based on the task being performed. Specifically, research has indicated that motivational self-talk improves performance of gross motor tasks to a greater extent than instructional self-talk, while performance of precision tasks tended to improve to a greater extent using instructional self-talk as compared to motivational self-talk (Hardy et al., 2005; Hatziegorakis et al., 2004).

Although not researched as extensively as positive self-talk, negative self-talk has generally been found to have a debilitative effect on athletic performance (e.g., Conroy & Metzler, 2004; Goodhart, 1986; Van Raalte et al., 1995; Wrisberg & Anshel, 1997), however, interestingly in some situations, has been shown to actually improve athletic performance (Dagrou, Gauvin, & Halliwell, 1992; Hatzigeorgiadis & Biddle, 2008; Van Raalte et al., 1994). However, the literature has yet to explore which form of performance task, gross motor or precision, would negative self-talk have the most debililating effect. Although, a few studies (Hardy et al., 2005; Hatzigeorgiadis et al., 2004; Theodorakis et al., 2000) have compared the use of instructional and motivational self-talk on performing specific tasks, there has not been a comparison using negative self-talk. In the few studies in which negative self-talk was utilized, results tended to contradict one another (Hardy, 2006). This study attempts to provide further clarification about negative self-talk.

1.2 Purpose of Study

The primary purpose of this study was to investigate the effects of motivational and instructional self-talk on gross motor and precision tasks related to throwing accuracy (i.e., precision task) and throwing distance (i.e., gross motor task). The secondary purpose was to investigate the effects of negative self-talk on the same gross motor and precision tasks to determine if negative self-talk would have a more debilitative effect on one type of task compared to the other. Researching the effects of self-talk may provide more insight into the possible benefits of using self-talk to improve athletic performance, as well as help determine the appropriate form of self-talk needed to optimize task specific performance.

1.3 Research Questions

This research study focused on investigating the effects of self-talk on a gross motor and precision task within softball. The study sought to investigate the following questions:

1. Which form of self-talk (i.e., intstructional or motivational) will enhance performance on a precision and gross motor task related to softball to the greatest extent?
2. Will negative self-talk have a more detrimental effect on the gross motor or precision softball task?

1.4 Significance of Study

It is important to determine if various forms of self-talk used in a particular context can improve performance and/or identify which forms of self-talk may be detrimental to athletic performance. Evidence from this study may provide coaches, educators, sport psychologists and mental training consultants with valuable information to make informed decisions when selecting the correct mental training technique (i.e., self-talk) to use, based on the type of task being performed (i.e., precision or a gross motor).

1.5 Definitions

The following definitions will be used in this study:

1. *Self-Talk*: Self-talk can: (1) "be statements made both internally or externally to oneself, (2) be multidimensional in nature, (3) have interpretive elements associated with the content of statements employed, (4) be somewhat dynamic,

and (5) serve at least two functions; instructional and motivational, for athletes" (Hardy, 2006, p. 84).

2. *Positive Self-Talk*: Self-talk used by an individual/player to help them to stay appropriately focused on the present and prevent him or her from dwelling on past mistakes or projecting too far into the future (Theodorakis et al., 2000).

3. *Negative Self-Talk*: Self-talk that is detrimental to performance because it is inappropriate, irrational, counterproductive or anxiety producing (Theodorakis et al., 2000).

1.6 Summary

This dissertation was completed using Memorial University's manuscript format. Included in this dissertation is an introduction (Chapter 1), review of the relevant literature (Chapter 2), and a research manuscript (Chapter 3). Based on this formatting some of the information presented in the dissertation may be repetitive.

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Chapter 2: Literature Review

2.1 Self-Talk Introduction

Self-talk or what people say to themselves either internally or externally while performing a task is a mental training technique that gained interest in the field sport psychology over the last number of years (Hardy, Roberts, & Hardy, 2009), and interest is ongoing. This literature review will: (1) present the definitions of self-talk, (2) examine the types and functions of self-talk, (3) provide a literature review of self-talk, (4) compare motivational and instructional self-talk, (5) investigate methods used in literature to isolate variables to examine the effects of self-talk, and (6) examine the facilitative and debilitative effects of motivational, instructional, and negative self-talk on precision and gross motor tasks.

2.2 Definition of Self-talk

Even though self-talk is a commonly researched topic in sport psychology many definitions have been proposed and a single definition has not been widely accepted. First, Bunker, Williams, and Zinsser (1993) provided a broad definition, viewing self-talk as "anytime you think about something" (p. 311). Second, self-talk as defined by Hackfort and Schwenkmezger (1993) considered an additional component, the individuals' feelings. They defined self-talk as an internal dialogue with oneself such as giving instructions and reinforcing or interpreting what a person is feeling and perceiving. A third definition defines self-talk as what learners say to themselves to think more precisely about their performance and to direct their actions in response to those reflections (Anderson, 1997). A fourth definition offered by Theodorakis et al. (2000) defined self-talk as "what people say to themselves either out loud or as a small voice

inside their head" (p. 254). A fifth and more commonly accepted definition based on the review of various definitions of self-talk, by Hardy (2006) and Van Raalte, Vincent and Brewer (2016) define self-talk as: (1) statements made both internally or externally to oneself, (2) multidimensional in nature, (3) having interpretive elements associated with the content of statements employed, (4) somewhat dynamic, and (5) serving at least two functions for athletes; instructional and motivational.

Finally, Zinsser, Bunker, and Williams (2010) added an additional component/area not covered by most definitions in the literature. They saw self-talk as sometimes being a distracter rather than a facilitator. From this viewpoint, attention is diverted from the current task, which is counterproductive to an automatic performance of a skill. Hardy, Hall, and Hardy (2005, p. 89) refer to this phenomenon as *"*paralysis by analysis*".* If an athlete places too much attention on every detail in a movement, then that movement becomes more difficult to perform successfully and performance suffers.

For the purpose of this study, the definition of self-talk provided by Hardy (2006) will be the definition used from this point onwards, as it is the most informative and descriptive.

2.3 What are the Types of and Functions of Self-talk?

Self-talk can be viewed as having two separate dimensions, positive and negative. The first dimension of self-talk is positive self-talk. Positive self-talk can be defined as self-talk used by individuals/players to help them to stay appropriately focused on the present and prevent them from dwelling on past mistakes or projecting too far into the future (Cumming et al., 2006; Hardy, Gammage, & Hall, 2001; Landin, 1994; Murphy & Martin, 2002). Positive self-talk may be further sub-divided into two functions based on

the specific function of the self-talk, motivational or instructional (Finn, 2008; Hardy et al., 2001; Theodorakis et al., 2000; Zinsser et al., 2010). Motivational functions of self-talk are thought to facilitate performance by increasing confidence, inspiring greater effort, energy expenditure, and by creating a positive mood. Examples of motivational self-talk include statements such as "you can do it", "hang in there", "strong", and "get tough" (Finn, 2008; Theodorakis et al., 2000). Instructional self-talk on the other hand is thought to enhance performance by triggering desired actions through proper focus, correct technique, and strategy execution (Hardy et al., 2001; Hardy, Jones & Gould, 1996; Zinsser et al., 2010). Examples of instructional self-talk would include statements such as "elbow straight," "reach", "stay low" and "move your feet" (Finn, 2008; Theodorakis et al., 2000).

Motivational and instructional self-talk have also been further categorized into additional sub components. Motivational self-talk can be divided into three categories: (1) motivational mastery, (2) motivational arousal, and (3) motivational drive (Hardy, 2006). It has been suggested that motivational mastery self-talk aids focus, increases self-confidence, and supports coping skills, while motivational arousal self-talk pertains to issues with decreasing stress, lowering anxiety, and increasing or decreasing arousal, depending on the situation (Hardy, 2006). Motivational arousal self-talk is often used to psych oneself up before or during an event or as an attempt to become more relaxed and decrease arousal levels (Hardy, 2006). Motivational drive self-talk is used to support drive, increase effort, help reach potential, help achieve goals, and to encourage oneself. Some examples of motivational drive self-talk would include, "come on you need to get

out there and practice", "the hard work will pay off in the end", and "stop messing around, it's really important that you use the correct technique here" (Hardy, 2006).

Instructional self-talk may be further sub-divided into two categories: cognitive general and cognitive specific (Finn, 2008; Hardy et al., 2001). Cognitive specific self-talk is used to aid in the execution of a specific skill and or in skill development such as squaring your shoulders to the basket in basketball. Examples of cognitive specific self-talk would be "shoulders square to the board" and 'follow through on the shot". Cognitive general self-talk is used to make improvements in overall performance and assist in planning play strategies. Examples of cognitive general self-talk would be "if he hits the ball deep then I have to throw it to the short stop so he can hold the runner on third" or "if the ball is hit on the ground past the pitcher then I'm heading for home".

The second dimension of self-talk is negative self-talk. Negative self-talk can be defined as self-talk that may be detrimental to performance because it is inappropriate, irrational, counterproductive or anxiety producing (Moran, 1996; Theodorakis et al., 2000). For example, "I will never get a hit off of this pitcher", "all my friends and family are here watching me play, if I screw up then I'll let everyone down" or "all of the other competitors are way more talented than me, I don't deserve to be here". Research conducted by Gould et al. (1992), Highlen and Bennett (1979), and Van Raalte et al. (1994) indicated the use of negative statements tends to affect performance in a debilitating manner.

2.4 Self-talk in the Literature

Self-talk is not exclusively referred to as a mental training technique for enhancing only sport performance as it has been used in several fields such as educational

psychology and exercise psychology. In that capacity, it has been used to help students improve their writing skills (Solley & Payne, 1992) and improve academic performance (Burnett, 2003; Callicott & Park, 2003). In exercise psychology, self-talk has been used to motivate adults to be more physically active (Gammage, Hardy, & Hall, 2001), aid in the reduction of exhaustion during endurance performance (Blanchfield, Hardy, DeMorree, Staiano, & Marcora, 2014), and assist those who are coping with cancer (Hamilton, Miedema, Macintyre, & Easley, 2011). Although self-talk is most commonly used to improve athletic performance and had been found to be an effective tool in improving athletic performance in a variety of sport contexts, such as darts (Aghdasi & Touba, 2012; Cumming, Nordin, Horton, & Reynolds, 2006; Van Raalte et al., 1995) diving (Highlen & Bennett, 1983), cycling (Hamilton, Scott, & MacDougal, 2007), figure skating (Ming & Martin, 1996; Palmer, 1992), handball (Zourbanos, Hatzigeorgiadis, Bardas, & Theodorakis, 2013), long jump (Panteli, Tsolakis, Efthimiou, & Smirniotou, 2013), soccer (Theodorakis, Weinberg, Natsis, Douma, & Kazakas, 2000), tennis (Cutton & Landin, 2007; Latinjak, Torregrosa, & Renom, 2011; Van Raalte, Brewer, Rivera, & Petitpas, 1994; Van Raalte, Cornelius, Brewer, & Hatten, 2000), swimming (Ay, Halaweh, & Al-Taieb, 2013; Hatzigeorgiadis, Galanis, Zourbanos, & Theodorakis, 2014; Zetou, Vernadakis, Bebetsos, & Makraki, 2012), water polo (Hatzigeorgiadis, Theodorakis & Zourbanos, 2004), volleyball (Zetou, Vernadakis, Evaggelos, & Makraki, 2012), golf (Harvey, Van Raalte & Brewer, 2002; Thomas & Fogarty, 1997) ice hockey (Rogerson & Hrycaiko, 2002), field hockey (Wrisberg & Anshel, 1997), basketball (Perkos, Theodorakis, & Chroni, 2002; Theodorakis, Chroni, Laparidis, Bebetsos, &

Douma, 2001). The following literature will focus on studies involving self-talk and performance.

2.5 Positive Self-talk and Performance

Positive self-talk or self-talk that is used by individuals to help them stay focused on the present and prevent them from dwelling on past mistakes or projecting too far into the future has been found to generally improve one's performance of a task in numerous studies (Cumming et al., 2006; Hardy, Gammage, & Hall, 2001; Landin, 1994; Murphy & Martin, 2002). Rushall et al. (1988) investigated the effects of three types of thought content instructions on the skiing performance of elite cross-country skiers. Participants were asked to think of one of three particular types of thoughts (i.e., task relevant statements, mood words, and positive self-talk statements) while they skied. Task relevant statements included those such as "long and powerful" and "full range movement". These statements could also be more specifically defined as instructional, as they refer to precise movements/techniques. Mood words included such things as "go!", "blast", "loooong", "drive, drive", and "rip, rip", while positive self-talk statements included such statements as "feel great", and "it's yours to take". Results indicated that each of the groups' times were significantly ($p < .001$) lower than that of the control group, illustrating the usefulness of self-talk during athletic events.

A second study that investigated the use of positive self-talk was conducted in the sport of figure skating. Ming and Martin (1996) conducted a study, which investigated the use of a self-talk package (i.e., instructional self-talk) to improve figure skating performance. In this study, participants attempted to successfully complete two figures with one figure being treated with the self-talk and one without. Ming and Martin found

that for each of the participants, the self-talk led to an improvement in performance of the treated figure while the untreated figure remained stable across practices. The results, suggested that self-talk along with practice can improve performance to a greater extent than through practice alone.

An additional study by Cutton and Landin (2007) investigated the effects of positive self-talk, and knowledge of performance on the learning of a forehand groundstroke in tennis. Participants were placed into one of three groups: self-talk strategy with knowledge of performance, self-talk strategy without knowledge of performance and knowledge of performance only. The self-talk group were instructed to say verbal cues such as "ready" to initiate the ready position, "turn" to turn hips and shoulders perpendicular to the net, "step" to begin weight transfer after "turn", "hit" to track the ball as far as possible into the contact area, and "finish" to fully follow through with the stroke during the performance of the action. The knowledge of performance group were provided with feedback from an instructor after every five attempts in relation to problems with their form, such as missing the ball or failing to turn hips and shoulders. The self-talk and feedback group contained elements of both the self-talk strategy and knowledge of performance groups. Outcome scores based on the Hewitt Tennis Achievement Test and Movement sequence scores (essentially a participants form during the forehand task) improved significantly ($p < .001$) from pre-test. The investigators concluded that self-talk without the addition of feedback can be an effective means to improve performance.

Further studies by Finn (2008), and Hardy et al. (2001) concluded that positive self-talk can increase an individuals confidence, regulate his/her arousal levels, affect

confidence and aid in strategy development/execution. Gould et al. (1992) used a qualitative methodology to investigate thoughts of U.S. Olympic wrestlers during their best matches. By classifying data retrieved by interviews, several major themes were identified. The researchers concluded that when participants felt they were performing their best, they reported being extremely confident, optimally aroused and focused on clear tactical strategies as indicated by the number of optimal mental state descriptions, positive expectancies, higher arousal levels, and higher levels of effort reported. The data provided evidence that self-talk can improve confidence, regulate arousal, and increase concentration. These tactical strategies fall under the domain of instructional self-talk since the strategies contained procedural information for specific approaches or movements.

In some circumstances self-talk has been found to have no significant effect on performance as indicated by Palmer (1992). She investigated the influence of two mental practice techniques on figure skating performance: the Martin self-talk technique and the paper patch technique, to the performance of a control group. In the study, the Martin self-talk technique required skaters to select words, which would help them concentrate on and correct specific elements of each figure they were practicing. This group also used these key words during on ice and off ice practice. The paper patch technique consisted of giving the skaters paper patch workbooks containing outlines of the figures they were practicing. Like the Martin self-talk technique, participants were asked to use key words to help them concentrate on specific elements of each figure. Once key words were established, participants traced the figure on paper over the outlines in their workbook while saying the key words out loud. After a four week period, Palmer determined there

were no significant differences between the Martin group and the control group, while the paper patch group showed significant improvements over both, indicating that some talk strategies may not be effective as others.

In summary, the research presented demonstrates that positive self-talk is a beneficial strategy for improving athletic performance.

2.6 Negative Self-talk and Performance

Studies primarily investigating the effects of negative self-talk on performance are limited in number but negative self-talk is often included in studies investigating the effects of positive self-talk. In addition to investigating the thoughts of Olympic wrestlers during their best matches, Gould et al. (1992) also investigated their thoughts during their worst matches. During wrestlers worst matches, they were not confident, had inappropriate feeling states, experienced many task irrelevant or negative thoughts and either deviated from strategic plans or made poor strategy choices. These negative aspects included "thinking about it too much" through "drawing a blank", thinking about a previous loss, future matches, the consequences of losing, and self-doubts about being able to rise to the occasion. This data coincides with the definition of negative self-talk while supporting the theory of negative self-talk leading detrimentally affecting athletic performance.

Conroy and Metzler (2004) investigated the relationship between negative self-talk and competitive anxiety. They investigated the patterns of self-talk associated with different forms of competitive anxiety including fear of failure, fear of success, and sport anxiety/competitive anxiety. The results of this study indicated that high levels of sport anxiety were related to self-talk when the self-talk involved low levels of self-

emancipation, self-affirmation, active self-love, and self-protection but higher levels of self-blame, self-attack, and self-neglect. Lower levels of sport anxiety were associated with higher scores of self-emancipation, self-affirmation, active self-love and self-protection and lower levels of self-blame, self-attack and self-neglect. The results indicated that negative self-talk is associated with higher amounts of sport anxiety, which lead to poorer performance, while positive self-talk was associated with lower amounts of sport anxiety and lead to improved performance.

In the sport of middle distance running Hatzigeorgiadis and Biddle (2008) examined the relationships between pre-competition anxiety, goal-performance discrepancies, and athletes' negative self-talk. Their findings concluded that cognitive anxiety intensity had a stronger relationship with negative self-talk than somatic anxiety. Additionally, the finding suggested discrepancies between performance-goals and performance was a significant predictor of negative self-talk. In other words if an athlete performed poorly, it was more likely that negative self-talk was employed.

Generally speaking, participants who use postive self-talk tend to improve their performances, while those using negative self-talk are detrimentally affected (Cumming, Nordin, Horton, & Reynolds, 2006; Cutton & Landing, 2007; Dagrou, Gauvin, & Halliwell, 1992; Rushall, Hall, Roux, Sasseville, & Rushall, 1988). However, a review by Hardy (2006) identified that negative self-talk may also assist performance rather than hinder it.

Hamilton, Scott and MacDougal (2007) assessed the effectiveness of self-talk on endurance performance. Participants in this study were given one of three self-talk interventions (i.e., self-regulated positive self-talk, assisted positive self-talk and assisted

negative self-talk), and asked to perform a 20-minute cycling ergometer workout in which they attempt to travel as far as possible. Results indicated that all participants placed in one of the two positive self-talk groups demonstrated an increase in performance from baseline while two of the three participants in the assisted negative self-talk group demonstrated an increase in performance compared to baseline measures.

As suggested by Hardy (2006), by Van Raalte et al. (1994) and Goodhart (1986), rather then demotivating participants, negative self-talk actually motivated them to try harder. They suggested it is not the 'actual' type of self-talk being used, which influences the athlete, but how it is interpreted. Athletes who interpret negative self-talk as indicating they cannot accomplish a goal may view this as a challenge and extend greater effort, resulting in negative self-talk becoming a motivator.

To sum up, the effects of negative self-talk can be thought of as somewhat unpredictable. In some studies negative self-talk may have a detrimental effect on performance, while in others it may have an enhancing effect on performance. It appears that how negative self-talk affects a person depends upon how the individual interprets the self-talk. If one considers the self-talk to be detrimental, then performance may suffer while those interpreting the self-talk as motivating may improve their performance.

2.7 Positive Self-talk Compared to Negative Self-talk and Performance

There has been limited research comparing the effects of negative self-talk and positive self-talk on same task performance. Cumming et al. (2006) investigated how both facilitative and debilitative self-talk and imagery could affect performance on a dart throwing task. Participants were placed into one of five groups: control, facilitative self-talk ("I will hit the bull's eye") and imagery, facilitative self-talk and debilitative

imagery, facilitative imagery and debilitative self-talk ("I will miss the bull's eye") and debilitative self-talk and imagery. The dart-throwing task involved throwing 15 darts at a dartboard with the highest point being awarded for hitting the bull's eye, and lower points being awarded as distance from the bull's eye increased. This task was completed three times, once for a baseline measure and two trial conditions. Results indicated that in comparison to baseline, participants in the facilitative imagery/facilitative self-talk condition performed significantly better in trial one and two and that participants in the debilitative imagery/debilitative self-talk condition performed significantly worse in both trial one and trial two in comparison to their baseline performance.

Dagrou et al. (1992) invesitgated the use of postive and negative self-talk on a dart throwing performance. Participants were placed in one of three self-talk conditions (i.e., positive self-talk, negative self-talk, and control), and asked to throw darts at a target. Results indicated that the positive self-talk group performed significantly better than the control group and negatitve self-talk group, while the control group performed significantly better than particiapnts who used negative self-talk.

Both studies suggest positve self-talk tends to improve performance as compared to negative self-talk which in most cases debilatates performance.

2.8 Comparison between Instructional and Motivational Self-talk

Motivational self-talk is designed to assist performance by improving confidence, enhancing effort, increasing energy expenditure, and creating a positive mood (Theodorakis et al., 2000). Instructional self-talk is designed to facilitate performance by triggering desired movements through correct focus, technique, and strategy execution (Hardy & Oliver, 2014). Hatziegorakis et al., (2004) and Hardy and Oliver (2014)

suggested that motivational self-talk is better suited to strength and endurance tasks, while instructional self-talk is better suited for movements that involve skill, timing or coordination, which are essentially precision movements.

Reviews conducted by Edwards, Tod, and Mcguigan (2008), Hatziegorakis et al. (2004), and Theodorakis et al. (2000) revealed a limited amount of research comparing the effectiveness or ineffectiveness of various forms of self-talk in the performance of gross motor or precision tasks. Additionally, there has been limited research investigating the effects of negative self-talk on performance in the same milieu. This study will attempt to extend the literature by comparing the effects of instructional, motivational, and negative self-talk on the performance of a precision (i.e., throwing a softball at a target) task and a gross motor (i.e., throwing a softball for distance) task. The following studies provide some examples of work that has been completed in this area.

Mallett and Hanrahan (1997) examined the effect of cognitive strategies for 100m sprinters. Participants were given cue words relating to a technical change in sprinting associated with a segment of the 100m distance. "Push" was used to identify the acceleration phase (0-30m) of the race, "heel" representing the maximum velocity phase (30 to 60m) and "claw" being in reference to the speed endurance phase (60-100 m). Compared to baseline measurements, the use of instructional cues during the 100m sprint resulted in significantly improved performance and more consistent times.

Landin and Hebert (1999) investigated the effects of self-talk on the performance of tennis players. Participants were required to return a tennis ball while attempting to hit the target area. A self-talk intervention consisting of two instructional cues were used; "split" which referred to the positioning of the body in preparation for the volley return

and “turn” which reminded participants to turn their shoulders in preparation to hit the ball. Results indicated that accuracy of hitting the target improved significantly from baseline measurements.

Theodorakis, Weinberg, Natsis, Douma, and Kazakas (2000) investigated the effectiveness of different self-talk strategies on increasing performance in various motor tasks. Their study consisted of four experiments, a soccer pass accuracy test, a badminton service test, a sit-up test and a knee extension test. Participants in the soccer pass accuracy (i.e., precision task) experiment were asked to kick a soccer ball into a goal. Participants were placed into one of three groups: control, motivational self-talk (i.e., “I can do it”) and instructional self-talk (i.e., “I see the target”) with the self-talk groups saying their phrase out loud or to themselves before each of 12 attempts. Results indicated that the instructional self-talk group performed significantly better than both the motivational self-talk group and the control group. Participants in the badminton service (i.e., precision task) experiment attempted to serve on to a circular target where point scores decreased as the distance from the center increased. Again the participants were placed into one of the three groups: control, motivational (i.e., “I can do it”) and instructional self-talk (i.e., “I see the net, I see the target”) and repeated the procedure of experiment one in terms completing their self-talk. Results indicated that participants of the instructional self-talk group performed significantly better than those of the motivational self-talk group and the control group. Contrary to what was predicted, there were no significant differences found between the forms of self-talk used and the number of sit-ups participants could perform in three-minutes or the amount of weight lifted in the knee extension task, both of which are considered to be gross motor tasks.

Perkos, Theodorakis, and Chroni (2002) researched the effect of instructional self-talk on the dribbling, shooting, and passing skills of novice basketball players. Participants were asked to repeat the statements “low” and “rhythm” when dribbling the ball, “fingers” and “target” when passing and “hand” and “center” when shooting to aid in the guiding of their movements. Results indicated the experimental group improved to a greater extent in all three tasks than that of the control group and performed significantly better in the passing and dribbling activity.

One of the most important studies with regard to self-talk and its effectiveness on precision and gross motor tasks was conducted by Hatzigeorgiadis, Theodorakis, and Zourbanos (2004). They investigated the use of instructional and motivational self-talk on two tasks, throwing a ball at a target and throwing a ball for distance. Participants were placed into one of three groups: control, motivational (“I can”), and instructional self-talk (“ball-target”). Participants were given ten throws: five for each target, which were located in the top corners of a water polo post. They were asked to complete the task twice with a period of two weeks between each session. Compared to baseline measurements both the motivational self-talk and instructional self-talk groups improved significantly while no significant differences were found for the control group. Based on mean targets hit in both sessions (3.65 and 5.20 vs. 3.50 and 4.75) the data suggests that instructional self-talk was more effective in the precision task than that of motivational self-talk. Experiment two asked the participants to throw a ball as far as they could. As in the first experiment participants were placed in one of three groups: control, motivational (“I can”) and instructional (“elbow-hand”). Participants were given ten attempts throwing the ball for distance with their average representing their score and had two sessions.

Results indicated that only the motivational self-talk improved significantly from baselines scores. When comparing the mean scores of the distance that the ball traveled between members of the motivational and instructional self-talk group, it was found that motivational self-talk had the greatest impact (11.22 m and 12.03 m as compared to 11.13 m and 11.40 m) on performance. It was concluded that motivational self-talk is more effective in gross motor tasks than instructional self-talk.

Zourbanos et al. (2013) investigated the use of motivational and instructional self-talk on the throwing of a handball at a target with a non-dominant hand. Participants were placed into one of three groups: motivational self-talk, instructional self-talk, and control. Participants made eight attempts to throw a handball with their non-dominant hand at a target with a point being awarded for each successful target strike. Results indicated that both instructional and motivational self-talk led to better performance as compared to the control group, while instructional self-talk led to greater performance than motivational self-talk.

A comparison between the effects of instructional and motivational self-talk on a modified push up task was conducted by Kolovelonis, Goudas, and Dermitzaki (2011). Their results indicated that while both forms of self-talk improved performance on the push up task compared to that of the control group, it was motivational self-talk that improved performance to the greatest extent. This finding is consistent with the already existing evidence supports the belief that motivational self-talk is a more effective technique to utilize when performing tasks which require gross motor skills.

Despite the existing evidence, there is still uncertainty around the effects of instructional and motivational self-talk on a precision task. A study by Hardy, Begley,

and Blanchfield (2015) found contrary instructional self-talk results. In their study 40 Gaelic footballers completed an accuracy task in which participants who used instructional self-talk should have outperformed participants who were placed in the motivational self-talk group. Their results suggested that participants who used motivational self-talk actually performed better than those who utilized instructional self-talk.

A review by Tod, Hardy, and Oliver (2011) found that studies involving instructional self-talk demonstrated improved performance 80% of the time on precision tasks and 70% of the time on gross motor tasks. It was also noted that studies involving motivational self-talk indicated an improved performance 67% of the time on precision tasks and 83% of the time on gross motor tasks (Tod et al., 2011).

Based on the current evidence presented both motivational and instructional self-talk can have positive effects on athletic performance. Generally speaking, while both forms of self-talk can improve performance, motivational self-talk is usually associated with improvements of gross motor tasks while instructional self-talk is associated with improvements of precision tasks. However, further research in this area is needed.

2.9 How to Examine the Effects of Self-Talk

In terms of examining the effects of self-talk, studies typically fall into one of two methodologies. In the first method, the investigators assign specific positive and or negative self-talk statements to the participants to control what statements are being said (Dagrou et al., 1992; Landin & Herbert, 1999; Perkos et al., 2002; Theodorakis et al., 2000; Van Raalte et al., 1995). The second method proposes that during an actual practice or competition setting an athlete would likely create their own form of self-talk and not

use assigned self-talk statements (Cumming et al., 2006; Cutton et al., 2007; Dagrou, Gauvin, & Halliwell, 1992; Landin & Herbert 1999; Perkos et al., 2002; Rushall et al., 1998; Theodorakis et al., 2000; Van Raalte et al., 1995). In Rushall's et al. study, they allowed the participants to create their own self-talk statements. Results indicated that performance improved as compared to the participants who did not use a form of self-talk. Be it assigned self-talk, or personally developed self-talk statements, performance tends to improve regardless of the method of delivery (Hardy, 2006). Self-generated self-talk statements would appear to have more ecological validity then assigned statements, as individuals in actual practice or natural settings are likely to create their own self-talk statements (Rushall et al., 1988).

In many studies involving self-talk, participants are required to engage in internal self-talk. This approach is often more difficult for the researcher to determine if the correct self-talk statements were used or even if the participant used self-talk at all. Only a few studies have allowed participants to verbalize their self-talk statements aloud (i.e., Beneka et al., 2013; Van Raalte et al., 1994; Van Raalte et al., 2000; Zetou, Vernadakis, & Evaggelos, 2014). To ensure that participants are using self-talk and reciting the correct self-talk statements, the use of external self-talk allows the researcher to confirm that the participants are completing the task accurately and using the appropriate self-talk.

In examining self-talk there are several approaches that one can take. One approach is having participants create their own self-talk statements. The second is assigning specific self-talk statements for the participants to utilize. After the forms of self-talk statements have been selected, how the participants recite these statements must be determined. The statements may be recited internally or externally. The key point to

keep in mind is making the approach as realistic as possible while maintain some degree of control.

2.10 Self-Talk Conclusion

The literature review provided some insight into designing a study involving self-talk and provided a number of factors that were considered when designing the current study. The literature indicates there seems to be a limited number of studies explicitly comparing the use of both motivational and instruction self-talk while performing gross motor and precision tasks, and none with the inclusion of negative self-talk. The results of the literature review suggest three main points. The first point suggests precision tasks improve to the greatest extent through the use of instructional self-talk (Hardy & Oliver, 2014; Hatziegorakis et al., 2004; Landin & Hebert, 1999; Perkos et al., 2002; Theodorakis et al., 2000; Zourbanos et al., 2013). Secondly, gross motor tasks should improve the most when using motivational self-talk (Hardy & Oliver, 2014; Hatziegorakis et al., 2004; Kolovelonis, Goudas, & Dermitzaki, 2011). Finally, negative self-talk would most likely have a detrimental effect on both gross motor and precision tasks, but this is unclear based on contradictory results as in some instances negative self-talk has shown to enhance performance (Conroy & Metzler, 1992; Gould et al., 1992).

The current study may also provide further evidence supporting the use of self-generated self-talk statements rather than the assignment of specific self-talk statements (Cumming, Nordin, Horton, & Reynolds (2006); Cutton, & Landin (2007); Dagrou, Gauvin, & Halliwell, 1992; Landin & Herbert 1999; Perkos et al., 2002; Rushall et al., 1998; Theodorakis et al., 2000; Van Raalte et al., 1995). This study will use a measure

that assess participants' self-talk use, as well as a measure that assessed the belief participants have in the effectiveness of self-talk. This data will provide information on how participants use self-talk and may demonstrate whether or not they believe it works. Measuring types and levels of self-talk may provide confirmation of the belief that motivational self-talk is related to performance of gross motor tasks, instructional self-talk is related to performance of precision sports and that negative self-talk usually has a detrimental effect on any tasks it is associated with.

Overall, the review of literature on self-talk has indicated that the topic has been examined extensively but there are still several areas in which gaps exist and further research is required. Most studies have demonstrated that positive self-talk improves athletic performance while negative self-talk may hinder or actually improve athletic performance. Furthermore, within positive self-talk, instructional self-talk has been found to improve performance in sports which require precision or fine motor skills while motivational self-talk has been found to improve performance in sports which require gross motor or power movements. There is however, a lack of research indicating which type of activity, gross motor or precision tasks that negative self-talk would have the most debilitative impact.

Therefore, the primary purpose of this study is to investigate which form of self-talk (i.e., intstructional or motivational) will enhance performance on precision and gross motor related tasks to the greatest extent. The secondary purpose is to determine whether negative self-talk will have a more detrimental effect on gross motor or precision tasks. Based on the literature review, it is hypothesized that motivational self-talk will improve gross motor tasks to the greatest extent, while instructional self-talk will improve

precision tasks to the greatest extent. Based on the contradictory results presented, it is unclear what effects negative self-talk would have on the two athletic tasks.

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Chapter 3

THE EFFECTS OF SELF-TALK ON GROSS MOTOR AND PRECISSION TASKS IN SOFTBALL

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3.1 Abstract

The purpose of this study was to further explore which form of self-talk (i.e., instructional or motivational) would enhance performance on precision and gross motor related tasks in the sport of softball. Additionally, the impact of negative self-talk on performance was explored. Eighty participants, forty males and forty female softball players (M = 34.04. SD = 10.16) were randomized into four self-talk groups: (1) instructional, (2) motivational, (3) negative, and (4) control group. Participants in the self-talk groups attended a self-talk training session, and generated their own self-talk statements. One week following the training session, all participants completed the athletic tasks (i.e., throwing a ball for distance and throwing at a target) using their generated self-talk statements, and these tasks were repeated two additional times with at least one week between each session. Although the findings were not significant, positive and negative self-talk was found to impact performance. Akin to previous studies, positive self-talk led to enhanced performance in both gross motor and precision tasks, while negative self-talk led to poorer performance in gross motor tasks. It may be suggested that the use of motivational and instructional self-talk may be an important mental training technique that coaches and athletes could utilise when attempting to enhance athletic performance.

Keywords: Self-talk, performance, precision task, gross motor task, softball

3.2 Introduction

Self-talk is a mental training technique that has received a great deal of research attention (Hardy, Roberts, & Hardy, 2009). Self-talk is simply what people say to themselves either internally or externally while performing a task (Hardy, 2006), and consists of five basic components: (1) statements that are made both internally or externally to oneself, (2) are multidimensional in nature, (3) have interpretive elements associated with the content of statements employed, (4) are somewhat dynamic and (5) serve at least two functions for athletes; instructional and motivational (Hardy, 2006; Van Raalte, Vincent, & Brewer, 2016).

Given the complexity and multidimensional nature of self-talk, it has been established that self-talk encompasses a number dimensions. Valence, one of the dimensions identified by Hardy (2006), is the most explored in the research literature (e.g., Van Raalte, et al., 1995). Valance has been divided into positive and negative categories (Hardy, Gammage, & Hall, 2001). Positive self-talk is used most often to keep athletes focused on the present and prevent them from dwelling on past mistakes or projecting too far into the future (Cumming et al., 2006; Hardy, 2006; Hardy, Gammage, & Hall, 2001; Landin, 1994; Murphy & Martin, 2002), whereas negative self-talk is believed to detrimentally affect performance because it is inappropriate, irrational, counterproductive or anxiety producing (Hardy, 2006; Moran, 1996; Theodorakis et al., 2000). Positive self-talk has been found consistently to enhance athletic performance (Hardy, 2006; Tod, Hardy, & Oliver, 2011), while the effects of negative self-talk have been inconsistent (Cumming, Nordin, Horton, & Reynolds, 2006; Cutton & Landin, 2007; Dagrou, Gauvin, & Halliwell, 1992; Hardy, 2006: Rushall, Hall, Roux, Sasseville, &

Rushall, 1988). The results of negative self-talk research have demonstrated that, negative self-talk can: (1) have detrimental effects on performance (Cumming et al., 2006; Hardy, Roberts, & Hardy, 2009; Van Raalte et al., 1994; Van Raalte et al., 1995; Wrisberg & Anshel, 1997), (2) improve performance (Hamilton et al., 2007), or (3) have no impact on performance (Tod et al., 2011). Van Raalte et al. (1994) contend that the enhancing or hindering effect of negative self-talk depends on how the self-talk is interpreted by the athlete. If negative self-talk is interpreted as a motivational tool, then performance may be enhanced. Arguably with these conflicting results, it is important to further explore the effect of negative self-talk on athletic performance.

In addition to the valence dimension of self-talk, there is also evidence that self-talk can serve a variety of purposes for athletes, such as motivational and instructional (Hardy, 2006; Hatzigeorgiadis et al., 2004; Theodorakis et al., 2000; Tod et al., 2011). Motivational self-talk is thought to facilitate performance by enhancing confidence, inspiring greater effort, energy expenditure, and by creating a positive mood (Finn, 2008; Theodorakis et al., 2000), and has been found to be effective in enhancing performance in sports, which require gross motor skills such as throwing an object for distance and running/sprinting (Hatzigeorgiadis, Theodorakis, & Zourbanos, 2004; Mallett & Hanrahan, 1997). Instructional self-talk, on the other hand, is thought to enhance performance by triggering desired actions through proper focus, correct technique and strategy execution (Hardy et al., 2001). Instructional self-talk has been used to enhance performance in sports that require accuracy, fine motor movements, skill, and timing such as hitting a target with a ball, serving in badminton, and accurately passing a soccer ball (Hardy, Jones, & Gould, 1996; Hardy et al., 2001; Hatzigeorgiadis, Theodorakis, &

Zourbanos, 2004; Landin & Hebert, 1999; Theodorakis et al., 2000; Zinsser et al., 2010) A review by Tod et al. (2011) found that studies involving instructional self-talk demonstrated improved performance 80% of the time on precision tasks and 70% of the time on gross motor tasks. It was also noted that studies involving motivational self-talk were found to have improved performance 67% of the time on precision tasks and 83% of the time on gross motor tasks (Tod et al., 2011). However, contradictory results have demonstrated that instructional self-talk may not only be best suited to be utilized on precision tasks (Hardy, Begley, & Blanchfield, 2015). Hardy et al. (2015) studied the effect of motivational and instructional self-talk on kicking accuracy with an athlete's dominant foot and found that those using motivational self-talk performed better than those using instructional self-talk, thus differing from the norm.

More research is needed to explore the effects of motivational and instructional self-talk on precision and gross motor tasks to provide a clearer understanding of the research area. The matching hypothesis theory suggests instructional self-talk helps athletes focus on task relevant cues, surmising it should be more effective than motivational self-talk on tasks dependent on technique (Hardy & Oliver, 2014). Motivational self-talk is believed to be more effective than instructional self-talk for execution of gross motor, strength based tasks because it helps the performer achieve a more appropriate mind set reflecting confidence and a positive mood state. However, much of the literature demonstrates the benefits of both types of self-talk, and does not clearly support that one type is more effective for a particular task (Hardy & Oliver, 2014). Additionally, no study has compared the effects of negative self-talk on precision and gross motor tasks.

Therefore, the primary purpose of this study was to investigate the effects of motivational and instructional self-talk on gross motor and precision tasks related to throwing accuracy (i.e., precision task) and throwing distance (i.e., gross motor task). The secondary purpose was to investigate the effects of negative self-talk on the same gross motor and precision tasks to determine if negative self-talk has a more debilitative effect on one type of task compared to the other. Previous research has hypothesized that motivational and instructional self-talk should improve performance on both tasks when compared to negative self-talk. However, it is expected that motivational self-talk would lead to the greatest performance improvements for the gross motor tasks, and that instructional self-talk would lead to the greatest performance improvements for the precision task (Tod et al., 2011). Due to conflicting research results for negative self-talk, no hypotheses were generated for this study.

3.3 Methods

3.3.1 Participants

Participants included forty male and forty female participants (M_{age} = 34.04 years, *SD*= 1.16 years) who were experienced softball players (*M* = 12.54 years playing, *SD* = 9.734 years) from the recreational slow pitch softball league located on the West Coast of the province of Newfoundland and Labrador. Overall, participants engaged in moderate to vigorous activity for an average of 112.75 (*SD*= 119.53) minutes per week. See table 1 for complete demographic information. Participants were randomly assigned into four groups: a control group (*n*= 20), motivational self-talk group (*n*= 20), an instructional self-talk group (*n*= 20) and a negative self-talk group (*n*= 20). Each group contained equal numbers of male and female participants.

3.3.2 Measures

Demographics characteristics were collected by self-report, and included information such as age, weight, height, gender, years of experience playing softball, current competitive level (A, B, or C division), highest competitive level obtained (e.g., regional's, provincials, nationals), physical activity participation, and frequency of strength training of participants. The Physical Activity Readiness Questionnaire (PAR-Q) was used to determine if participants were 'healthy' to participate in the study. The PAR-Q contains questions, which inquire about possible health issues such as heart conditions. Potential volunteers were ineligible to participate if they indicate a "YES", on any item in the PAR-Q unless they obtained physician's clearance.

Self-talk was assessed using the Self-Talk Questionnaire (S-TQ) which measures two functions of self-talk, motivational and cognitive functions (Zervas, Stavrou, & Psychountaki, 2007), and the Belief in Self-Talk Questionnaire (BST; Araki et al., 2006), which assesses a participant's belief of the effectiveness of self-talk. The S-TQ consists of eleven items, which measure motivational (n= 7) and instructional (n= 4) functions of self-talk on a 5-point Likert scale (1= never to 5 = always). A high score on the S-TQ would indicate that an individual frequently uses self-talk. The Cronbach alpha's for the S-TQ was 0.92, and the questionnaire has been found to be valid and reliable (Zervas, Stavrous, & Psychountaki, 2007). The BST consists of eight items, four of which assess individuals levels of agreement with statements regarding their beliefs related to self-talk's ability to enhance performance, and four items which assess their belief that negative self-talk can harm performance. Items were rated on a 5-point Likert scale from strongly disagree (0) to strongly agree (5). A high score on the BST would indicate that

an individual has strong belief in their self-talk. The reliability coefficient for the BST was 0.85 from baseline testing to trial three, and the questionnaire has previously been validated (Boroujeni & Ghaheri, 2011). See Table 2 and 3 for descriptive statistics of participants' scores on the ST-Q and the BST.

The Leisure Score Index (LSI) of the Godin Leisure Time Exercise Questionnaire developed by Godin and Sheppard (1985) was used to assess participants' weekly physical activity levels. The LSI contains three questions to assess the frequency of light, moderate, and vigorous physical activity over a typical week in the previous month that lasted for at least 10-minutes and was done during leisure time (Godin & Sheppard, 1985). For the purpose of this study, the LSI was modified to contain a measure for duration, which is a common modification in the field of physical activity (e.g., Courneya et al., 2002; McGowan et al., 2013). The reliability coefficient of the LSI has been found to be 0.62 or moderate (Eisenmann, Milburn, Jacobsen, & Moore, 2002). This questionnaire was found to be valid by Jacobs, Hartman and Leon (1993).

3.3.3 Experimental Tasks

The precision throwing task required participants to hit a target placed on a canvas measuring eight feet square that was lowered from the overhang near home plate and raised three feet above the ground (Brace, 1966). The target consisted of three concentric circles marked by lines one inch wide. The center circle was two feet in diameter (i.e., outside measurement), the next circle was four feet in diameter (i.e., outside measurement), and the outer circle was six feet in diameter. After two practice throws, the participant attempted to hit the target 10 times from a distance of 40 feet. All throws were made with both feet behind the throwing line and one or two steps were allowed.

Balls that struck the center circle, middle area and outer area were given point values of three, two, and one respectively. No points were awarded if the target was missed. If the one-inch divider was struck, the lower point was awarded. The final score was the sum of points awarded on the ten throws (i.e., 30 was the highest possible score). To ensure accurate tallying of scores participants were recorded completing this task and videos were reviewed.

The gross motor throwing task required participants to throw a softball for distance ten times. The throw was made from the warning track in center field towards home plate located 260ft away. Prior to beginning this trial, five practice throws were permitted. During practice and the trials, participants were allowed to take three steps before they released the ball. A tally of the total distance thrown from the warning track was recorded, and the distance of each attempt was measured using a tape measure and was rounded to the nearest foot.

3.3.4 Procedure

Institutional ethical approval was obtained prior to recruiting participants. Participants were recruited through the use of social media (i.e., Facebook) and by word of mouth. Interested participants were explained the purpose of the study through a brief meeting with the investigator, and completed an informed consent form and the PAR-Q. Participants that were eligible then completed a baseline questionnaire package that contained measures of demographic information, physical activity, and self-talk.

Prior to completing baseline precision and gross motor tasks, participants completed a brief warm-up routine. The routine consisted of 15 arm circles in both directions, 15 huggers (i.e., spread your and then proceed to close (hug) them around your

body switching arm position left harm on top to right arm on top with each movement), 15 Karen pot stirrers (i.e., a ballistic stretch in which you bend over at the waist, and move your arm in a circular motion) with each arm, 15 helicopters and two minutes of gentle catch. The ten precision throws were completed first, followed by the ten gross motor throws.

After baseline testing was completed, participants were randomly assigned to one of four groups (i.e., motivational self-talk, instructional self-talk, negative self-talk or control). The experimental groups (i.e., motivational self-talk, instructional self-talk, negative self-talk) were also provided a mental training session on self-talk which occurred in a classroom setting. During the session an overview of self-talk was presented that included the benefits of self-talk and how to use self-talk effectively. In the self-talk session participants were provided with a self-talk creation form and asked to create three personal self-talk statements for instructional, motivational, and negative self-talk. The researcher ensured that the forms and the self-talk statements were completed correctly (i.e., instructional self-talk statements were actually instructional self-talk statements). Participants were then asked to practice their self-talk statements three times in the week prior to the experimental trial. During the experimental trials, self-talk groups verbally used one of their self-talk statements before each task to ensure that self-talk was being used. Each participant used the same self-talk statement throughout the study for each task attempt. After each trial session all groups completed both the S-TQ and the BST. In total, all participants were asked to complete the two experimental tasks a total of three times over the duration of the study with at least one week in between trials. The control group did not receive the self-talk session but instead were asked to continue on with their

"normal" daily/weekly routines throughout the experimental process. At the end of the study the control group received a de-briefing session. At this time participants were given an opportunity to attend the same self-talk session as the experimental groups received.

As testing took place in an outdoor setting an attempt to control environmental conditions was made. Each session only occurred if: (1) there was a minimum temperature of 15ºC outside, (2) the wind speed ranged from 10-35km per hour in a northwest direction and, (3) no precipitation was present.

3.4 Results

3.4.1 Analyses

Statistical analyses were performed using SPSS 17 (2008). Descriptive statistics for both the gross motor tasks and the precision tasks were calculated (see Table 4 and Table 5). Separate repeated measures ANOVA were conducted to explore the impact of self-talk on athletic performance (i.e., precision or gross motor).

Gross Motor Performance:

Mauchly's Test of Sphericity indicated that the assumption of sphericity had been violated $x^2(5) = 71.14$, $p < .05$, therefore degrees of freedom were corrected using Greenhouse-Geisser estimates of sphericity ($\varepsilon = .66$). A 4 (group) X 3 (time) repeated measure ANOVA revealed that no significant (F (5.93, 150.33) = 0.057, $p > .05$) group by time differences were found between the scores obtained for the gross motor task. When compared to before beginning self-talk training (baseline testing) to finishing self-talk training (after trial 3), the descriptive statistics (see Table 4) indicated that the groups

using instructional self-talk improved their performance with a mean improvement of 23.1ft and a final SD of 309.44. Likewise, motivational self-talk had a positive impact on performance with a mean improvement and 22.4ft with a SD of 437.36. Neither of these improvements were found to be significant. The negative self-talk group showed a decline in performance from baseline to trial 3 with a mean decline of 10ft and a SD of 297.72. The control group showed an improved performance from baseline measures to trial 3 with a mean increase of 11.75ft and SD of 579.05.

Precision Performance

Mauchly's Test of Sphericity indicated that the assumption of sphericity had been violated $x^2(5) = 17.15$, $p < .05$, therefore degrees of freedom were corrected using Huynh-Feldt estimates of sphericity ($\varepsilon = .94$). A 4 (group) X 3 (time) repeated measure ANOVA revealed that no significant (F (8.44, 213. 84) = 0.124, $p > .05$) group by time differences were found between the scores obtained in the precision task. When compared to before beginning self-talk training (baseline testing) to finishing self-talk training (after trial 3), the descriptive statistics (see Table 5) indicated that all groups (control, motivational self-talk, instructional self-talk, negative self-talk) demonstrated improved with a mean improvement of 1.7 (SD = 2.61), 2.05 (SD=1.94), 2.0 (SD=1.57), and 0.2 (SD=1.11) respectively.

3.5 Discussion

The goal of this study was to identify whether various forms of self-talk would have a performance enhancing or debilitating effect on the throwing performance of recreational softball players. Unfortunately the results of this study did not produce any

significant results illustrating the possible positive or negative effects of utilizing self-talk. The results did indicate that participants who used positive self-talk (instructional and motivational) improved throwing accuracy and distance to some extent but not to the levels as suggested in previous studies (Aghdasi & Touba, 2012; Ay, Halaweh, & Al-Taieb, 2013; Hatzigeorgiadis, Galanis, Zourbanos, & Theodorakis, 2014; Zetou, Vernadakis, Bebetsos, & Makraki, 2012; Zourbanos, Hatzigeorgiadis, Bardas, & Theodorakis, 2013), while the use of negative self-talk though not at significant levels, appeared to have had both beneficial and harmful effects on performance coinciding with research already in the literature (Conroy & Metzler, 2004; Dagrou, Gauvin, & Halliwell, 1992; Hardy, 2006; Hatzigeorgiadis & Biddle, 2008; Van Raalte et al., 1995; Wrisberg & Anshel, 1997).

The main question to attempt to answer now is why did this study not produce significant results beit coincideing or contradicting with previous research? One of the possible factors leading to this results was the fact that the study was underpowered. A larger sample may have provided the study with the neceassary power to provide significant results. A second factor leading to non significant results was that the interventions did not produce the desired/expected resutls. There may be two possible reasons why this was so. The first being in order for self-talk to be effective it has to be practiced. In this study participants were asked to practice their self-talk on their own time, however their was no check in effect to insure that they did so. A second reason of why the intervetnion may not have worked may have been the various levels of exposure to the sport some participants may have had during the testing period. In other words, some participants may have played only one or two games a week while others may have

had two games of week of league play plus tournaments, other out of town league games, practices etc or essentially they played more so their performance improved more as a result. A third possibility of why the results of the study were not significant may have been that many studies involving self-talk take place in a controlled setting, while this study did not (Tod, Hardy, & Oliver 2011). This study being conducted outside may have led to environmental factors influencing results. A change in wind speed may change the course of the ball, an increase in temperature or a change in humidity levels may cause distress to the participants affecting performance. A fourth possible reason for non significant results in performance may be due to the experimental tasks, in particular the precision task. Even though the recommended distance of 40ft was used in this study, this distance is relatively short and is roughly equivalent to that of the pitchers circle to home plate circle as compared to the distance between the bases (60ft). It could be argued that most plays on the field occur at distances greater than 40ft, and a further distance from the target would constitute a more reasonable test of one's accuracy. A shorter distance from the target may result in many participants obtaining similar scores and thus not producing significant results. A fifth and final reason why non significant results were not obtained may have been scheduling conflicts during testing trials. The trials were meant to take place at least one week apart but this was not always possible, as busy work schedules, family commitments, and poor weather were common challenges that had to be dealt with.

This study contributed to the self-talk literature in several fashions by futher exploring the possible beneficial effects self-talk use use by athletes. This study involved the use of a sample group (recreational softball players) not yet explored when

investigating the use of self-talk with regards to performance of precision and gross motor tasks. The use of a randomized sample that included an equal representation of males and females and the use of various self-talk assessements could also be considered a strength. The mean age of particiapants for this study was 34.04 years of age while as indicated by Tod, Hardy and Oliver (2011) the mean age of particiapnts involved in previous self-talk studies was 19.16.

Since this study used a sample of recreational softball players it would be interesting to determine if the findings of this study would be applicable to more competitive softball players or baseball players, as similarities exist between the sports. Findings of the effects of self-talk on hitting and running performance may be an interesting area to investigate in the future as it is another key component of the game of softball. Future studies may also benefit with the use of a younger and/or older population sample.

In summary, the results of this study even though non significant, did demonstrate that both negative and positive self-talk may have an effect on athletic performance but not to the same extent as was demonstared in the literature (Aghdasi & Touba, 2012; Ay, Halaweh, & Al-Taieb, 2013; Conroy & Metzler, 2004; Dagrou, Gauvin, & Halliwell, 1992; Hardy, 2006; Hatzigeorgiadis & Biddle, 2008; Hatzigeorgiadis, Galanis, Zourbanos, & Theodorakis, 2014; Van Raalte et al., 1995; Wrisberg & Anshel, 1997; Zetou, Vernadakis, Bebetsos, & Makraki, 2012; Zourbanos, Hatzigeorgiadis, Bardas, & Theodorakis, 2013). Based on the results of this study, it is reccommended that athletes and coaches consider the mental training technique of self-talk when attempting to enhance performance.

3.6 References

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3.7 Tables and Figures

Table 1. *Demographic Characteristics of Participant Groups*

Variable	Overall (N = 80)	Control Group (n = 20)	Motivational (n = 20)	Instructional (n = 20)	Negative (n = 20)	Statistic	p-level
Age (years; *M* (*SD*))	34.04 (10.12)	34 (9.09)	32.45(10.53)	35.8 (11.97)	33.9 (9.1)	$F(3, 76)= .359$	.783
Height (In; *M* (*SD*))	68 (3.49)	67.95 (3.52)	67.8 (3.61)	67.7 (3.15)	68.55 (3.86)	$F(3, 76)= .231$	.874
Weight (lbs, *M* (*SD*))	167.68 (40.32)	168.8 (42.67)	168.05 (44.08)	164.5 (34.79)	169.35 (42.1)	$F(3, 76)= .057$	.982
Experience (yrs; *M* (*SD*))	12.54 (9.73)	11.75 (8.77)	13.35 (10.45)	13.89 (11.42)	11.25 (8.52)	$F(3, 76)= .310$	.818
Competition Level							
A	15%	25%	25%	16.7%	33.3%	$\chi^6(4, n = 80) = 4.77$	.574
B	48.8%	23.1%	33.3%	20.5%	23.1%		
C	36.2%	27.6%	13.8%	20.5%	23.1%		
Highest Level							
N/A	28.8%	30.4%	8.7%	21.7%	39.1%	$\chi^9(4, n = 80) = 7.54$	.581
Regional	30%	25%	9.2%	25%	20.8%		
Provincial	30%	25%	33.3%	25%	16.7%		
National	11.2%	11.1%	33.3%	33.3%	22.2%		
Strength (Min; *M* (*SD*))	110.63 (128.14)	60.00 (70.19)	105.00 (119.80)	151.50 (175.06)	126.00 (116.64)	$F(3, 76)= 1.890$	.138
Mod-Vig (Min; *M* (*SD*))	112.75(119.53)	82.25(70.44)	146.25 (149.1)	102 (108.38)	115.5 (135.93)	$F(3, 76)= .880$	.445
Resistance (Min; *M* (*SD*))	29.31 (29.88)	23.25(27.5)	23.25 (28.16)	37.75 (32.54)	33 (30.63)	$F(3, 76)= 1.19$	.319

Note: Mod-Vig (Min): moderate to vigorous exercise minutes/week: Strength training (Min): strength training minutes/week: Resistance (Min): resistance Min/week.

Table 2. *Descriptive Statistics for STQ Questionnaire*

Group	Baseline *M (SD)*	Trial 1 *M (SD)*	Trial 2 *M (SD)*	Trial 3 *M (SD)*
Control	32.00 (7.71)	32.15 (7.76)	32.50 (7.84)	32.55 (7.59)
Motivational	31.15 (7.58)	31.95 (7.59)	33.15 (6.97)	34.20 (7.39)
Instructional	30.85 (6.71)	31.50 (6.45)	34.55 (5.70)	35.50 (5.80)
Negative	31.80 (7.65)	32.35 (7.46)	34.35 (5.77)	34.90 (5.67)

Table 3. *Descriptive Statistics for BST Questionnaire*

Group	Baseline *M(SD)*	Trial 1 *M(SD)*	Trial 3 *M(SD)*	Trial 3 *M(SD)*
Control	28.20 (6.76)	28.35 (6.80)	28.70 (6.68)	28.60 (6.91)
Motivational	26.15 (5.00)	26.40 (4.55)	28.10 (4.34)	29.10 (3.89)
Instructional	22.10 (5.63)	23.20 (6.34)	25.65 (5.10)	26.25 (5.20)
Negative	23.45 (8.78)	23.20 (8.66)	27.45 (5.48)	27.9 (5.68)

Table 4. *Descriptive Statistics for Performance of Gross Motor Tasks of Each Self-Talk Group*

Group	Baseline *M (SD)*	Trial 1 *M (SD)*	Trial 2 *M (SD)*	Trial 3 *M (SD)*
Control (ft)	1667.80 (581.83)	1677.30 (586.22)	1679.35 (582.57)	1668.35 (579.05)
Motivational (ft)	1597.60 (425.68)	1600.20 (431.77)	1605.00 (436.34)	1620.00 (437.36)
Instructional (ft)	1651.50 (308.88)	1651.95 (307.63)	1664.90 (308.54)	1674.60 (309.44)
Negative (ft)	1638.95 (285.71)	1638.10 (287.78)	1635.70 (296.74)	1628.95 (297.72)

Note: ft refers to measurement in feet for each trial

Table 5. *Descriptive Statistics for Performance of Precision Tasks of Each Self-Talk Group*

Group	Baseline *M (SD)*	Trial 1 *M (SD)*	Trial 2 *M (SD)*	Trial 3 *M (SD)*
Control (pts)	22.05 (2.67)	22.90 (2.86)	23.30 (2.81)	23.75 (2.61)
Motivational (pts)	23.05 (3.14)	23.80 (2.35)	24.20 (2.17)	25.10 (1.94)
Instructional (pts)	23.60 (2.85)	24.40 (1.93)	24.70 (2.30)	25.60 (1.57)
Negative (pts)	24.60 (1.76)	24.90 (1.12)	25.00 (1.01)	24.80 (1.11)

Note: pts refers to number points out of 30 assigned for each trial

3.8

PAR-Q & YOU

Physical Activity Readiness

(A Questionnaire for People Aged 15 to 69)

Regular physical activity is fun and healthy, and increasingly more people are starting to become more active every day. Being more active is very safe for most people. However, some people should check with their doctor before they start becoming much more physically active.

If you are planning to become much more physically active than you are now, start by answering the seven questions in the box below. If you are between the ages of 15 and 69, the PAR-Q will tell you if you should check with your doctor before you start. If you are over 69 years of age, and you are not used to being very active, check with your doctor.

Common sense is your best guide when you answer these questions. Please read the questions carefully and answer each one honestly: check YES or NO.

YES NO

___ ___ **1. Has your doctor ever said that you have a heart condition and that you should only do physical activity recommended by a doctor?**

___ ___ **2. Do you feel pain in your chest when you do physical activity?**

___ ___ **3. In the past month, have you had chest pain when you were not doing physical activity?**

___ ___ **4. Do you lose your balance because of dizziness or do you ever lose consciousness?**

___ ___ **5. Do you have a bone or joint problem (for example, back, knee or hip) that could be made worse by a change in your physical activity?**

___ ___ **6. Is your doctor currently prescribing drugs (for example, water pills) for your blood pressure or heart condition?**

___ ___ **7. Do you know of any other reason why you should not do physical activity?**

If you answered YES to one or more of these questions:

Talk with your doctor by phone or in person BEFORE you start becoming much more physically active or BEFORE you have a fitness appraisal. Tell your doctor about the PAR-Q and which questions you answered YES.

- *You may be able to do any activity you want — as long as you start slowly and build up gradually. Or, you may need to restrict your activities to those which are safe for you. Talk with your doctor about the kinds of activities you wish to participate in and follow his/her advice.*
- *Find out which community programs are safe and helpful for you.*

If you answered NO

If you answered NO honestly to all PAR-Q questions, you can be reasonably sure that you can:

- *start becoming much more physically active – begin slowly and build up gradually. This is the safest and easiest way to go.*

- take part in a fitness appraisal – this is an excellent way to determine your basic fitness so that you can plan the best way for you to live actively. It is also highly recommended that you have your blood pressure evaluated. If your reading is over 144/94, talk with your doctor before you start becoming much more physically active.

PLEASE NOTE: If your health changes so that you then answer YES to any of the above questions, tell your fitness or health professional. Ask whether you should change your physical activity plan.
Informed Use of the PAR-Q: The Canadian Society for Exercise Physiology, Health Canada, and their agents assume no liability for persons who undertake physical activity, and if in doubt after completing this questionnaire, consult your doctor prior to physical activity.
NOTE: If the PAR-Q is being given to a person before he or she participates in a physical activity program or a fitness appraisal, this section may be used for legal or administrative purposes.

"I have read, understood and completed this questionnaire. Any questions I had were answered to my full satisfaction."

Study Code _____

SELF-TALK QUESTIONNAIRE (S-TQ)

DIRECTIONS: Below are some statements that describe athletes' self- talk during an important competition. Please read each one carefully and indicate **how often** you have used self-talk. Your answers will be treated as absolutely confidential.

	When I compete	Never	Rarely	Some times	Often	Always
1.	I talk to myself in order to be able to concentrate more fully on the competition……	1	2	3	4	5
2.	I talk to myself about the technical elements of the competition……...	1	2	3	4	5
3.	I talk to myself to give directions …….	1	2	3	4	5
4.	I talk to myself to enhance my self-confidence…….	1	2	3	4	5
5	I talk to myself to motivate myself……...	1	2	3	4	5
6	I talk to myself to increase my effort…….	1	2	3	4	5
7	I talk to myself to encourage myself……...	1	2	3	4	5
8	I talk to myself to strengthen a positive thought……	1	2	3	4	5
9	I talk to myself to stop negative thinking……..	1	2	3	4	5
10	I talk to myself in order to help myself to relax……..	1	2	3	4	5
11	I talk to myself to correct my mistakes……	1	2	3	4	5

Self-Talk Creation Form

Self-Talk- self-talk is an internal dialogue with oneself in which instructions are given, reinforcement of behavior and/or interpretation of feelings occurs.

Positive Motivational Self-Talk Statements:

List one to three self-talk statements in each slot based on the instructions provided
Positive motivational self-talk statement(s) that would encourage you to try harder to improve on a previous performance or attempt

1._____

2._____

3._____

Negative Self-talk Statements:

Negative motivational self-talk statements that would discourage you from trying harder to improve upon previous performances or cause you to quit

1._____

2._____

3._____

Positive Instructional Self-Talk Statements:

Positive instructional self-talk statements that would help maintain proper form/technique or aid in performing a specific task

1._____

2._____

3._____

Demographic Information

This next part of the questionnaire is needed to help understand the demographic characteristics of the people participating in the study. For this reason it is very important information. All information is held in strict confidence and its presentation to the public will be group data only.

1. Age: _____

2. Height (In): _____ Weight (Lbs):_____

3. Gender: Male _____ Female_____

4. Number of years playing softball: _____

5. Current competitive level: A Division_____ B Division_____ C Division___

6. Highest competitive level obtained:

Regional's_____ Provincials_____ Nationals_____

7. Number of hours per week participating in strength training: _____

8. Types of strength training done:

Power lifting_____ Bodybuilding_____ Isometric_____

Circuit training_____ Weight lifting_____

Belief in Self-Talk Questionnaire

For each of the following statements indicate the extent to which you disagree or agree by circling a number to the right.

	Strongly disagree	Moderately disagree	Disagree somewhat	Agree somewhat	Moderately agree	Strongly agree
1. I believe that my positive thoughts really help me to concentrate on a task.	0	1	2	3	4	5
2. I believe that my negative thoughts can directly hurt my performance.	0	1	2	3	4	5
3. I believe that my positive thoughts can lead to a good performance.	0	1	2	3	4	5
4. I believe that my negative thoughts can break my concentration.	0	1	2	3	4	5
5. My belief in my ability to do a task will help to improve my performance.	0	1	2	3	4	5
6. I believe that my negative thoughts can increase my anxiety about performance.	0	1	2	3	4	5
7. I believe that my positive thoughts will relax me enough to perform well.	0	1	2	3	4	5
8. I believe that doubting my ability to do a task hurts my performance.	0	1	2	3	4	5

Leisure Score Index

IMPORTANT: This next set of questions focus on leisure-time physical activity. Leisure time means activity done during your free time and does not include your work/job or household chores. Physical activity means any activity that results in a substantial increase in energy expenditure (resulting in a noticeable increase in heart rate and breathing rate). Examples of physical activities include brisk walking, jogging, cycling, swimming, and dancing. Please note that from here on out we will use **PA** as a short form for physical activity.

For this next question, we would like you to recall your average weekly participation in leisure time PA **during the past month**.

When answering these questions please remember:

- Only count PA sessions that lasted 10 minutes or longer in duration.
- Only count PA that was done during free time (i.e., not occupation or housework).
- Note that the main difference between the first three categories is the intensity of the endurance (aerobic) PA and the fourth category is for strength (resistance) exercise.
- Please write the average frequency on the first line and the average duration on the second.
- If you did not do any PA in one of the categories, please write in "0".

Considering a typical week (7 days) over the PAST MONTH how many days on average did you do the following kinds of PA and what was the average duration?

	Times Per Week	Average Duration
a. **VIGOROUS INTENSITY EXERCISE** (HEART BEATS RAPIDLY, SWEATING (e.g., running, aerobics classes, cross country skiing, vigorous swimming, vigorous bicycling).	_____	_____
b. **MODERATE INTENSITY EXERCISE** (NOT EXHAUSTING, LIGHT PERSPIRATION) (e.g., fast walking, tennis, easy bicycling, easy swimming, popular and folk dancing).	_____	_____
c. **LIGHT INTENSITY EXERCISE** (MINIMAL EFFORT, NO PERSPIRATION) (e.g., easy walking, yoga, bowling, lawn bowling, shuffleboard).	_____	_____
d. **RESISTANCE/STRENGTH EXERCISE** (e.g., lifting weights, push ups, sit ups therabands).	_____	_____

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